incidentally benefit the European officers also.   In the report and appendix the summaries of the facts relating to Europeans in the civil or military services are compared.   The general tenor of the report leads irresistibly to the conclusion that the great mortality, which formerly decimated the Indian armies, might, by judicious arrangements, be reduced to the ordinary rate amongst European civilians there; whilst the mortality amongst the latter has for many years undergone so great an improvement, as to present at some ages no very striking contrast with that of similar classes in this country; a remarkable proof that the science of statistics is not (as it used to be thought) a mere dry and tedious marshalling of figures, but an eminently practical and useful study, leading, even in the small part of its domain which we are now exploring, to suggestions which may be the means of preserving thousands of lives, and substituting the enjoyments of healthy existence for the uncontrolled ravages of disease and death.

A Budget of Paradoxes.   By Professor De Morgan.

No. XIV.   1830—1833.

(Continued from p. 232.)

Demonville.—A Frenchman's Christian name is his own secret, unless there be two of the surname.   M. Demonville is a very good instance of the difference between a French and English discoverer. In England there is a public to listen to discoveries in mathematical subjects made without mathematics : a public which will hear, and wonder, and think it possible that the pretensions of the discoverer have some foundation.   The unnoticed man may possibly be right : and the old country-town reputation which I once heard of, attaching to a man who "had written a book about the signs of the zodiac which all the philosophers in London could not answer," is fame as far it goes.   Accordingly, we have plenty of discoverers, who, even in astronomy, pronounce the learned in error because of mathematics.   In France, beyond the sphere of influence of the Academy of Sciences, there is no one to cast a thought upon the matter : all who take the least interest repose entire faith in the Institute.   Hence the French discoverer turns all his thoughts to the Institute, and looks for his only hearing in that quarter. He therefore throws no slur upon the means of knowledge, but would say, with M. Demonville—" A l'égard de M. Poisson, j'envie loyalement la millième partie de ses connaissances mathématiques,

pour prouver mon système d'astronomie aux plus incrédules."
This system is that the only bodies of our system are the earth,
the sun, and the moon; all the others being illusions, caused by
reflexion of the sun and moon from the ice of the polar regions.
In mathematics, addition and subtraction are for men; multipli-
cation and division, which are in truth creation and destruction,
are prerogatives of Deity. But *nothing* multiplied by *nothing* is
one. M. Demonville obtained an introduction to William the
Fourth, who desired the opinion of the Royal Society upon his
system: the answer was very brief. The King was quite right;
so was the Society: the fault lay with those who advised His
Majesty on a matter they knew nothing about. The writings of
M. Demonville in my possession are as follows. The dates—which
were only on covers torn off in binding—were about 1831–34:—

"Petit cours d'astronomie"; followed by "Sur l'unité mathématique."
—Principes de la physique de la création implicitement admis dans la
notice sur le tonnerre par M. Arrago.—Question de longitude sur mer.—
Vrai système du monde (pp. 92). Same title, four pages, small type.
Same title, four pages, addressed to the British Association. Same title,
four pages, addressed to M. Matthieu. Same title, four pages, on M. Bou-
vard's report.—Résumé de la physique de la création; troisième partie du
vrai système du monde.

> The quadrature of the circle discovered, by Arthur Parsey, author of
> the "Art of miniature painting." Submitted to the consideration of
> the Royal Society, on whose protection the author humbly throws
> himself. London, 1832, 8vo.

Mr. Parsey was an artist, who also made himself conspicuous
by a new view of perspective. Seeing that the sides of a tower,
for instance, would appear to meet in a point if the tower were
high enough, he thought that these sides ought to slope to one
another in the picture. On this theory he published a small work,
of which I have not the title, with a Grecian temple in the frontis-
piece, stated, if I remember rightly, to be the first picture which
had ever been drawn in true perspective. Of course the building
looked very Egyptian, with its sloping sides. The answer to his
notion is easy enough. In July, 1831, reading an article on
squaring the circle, and finding that there was a difficulty, he set
to work, got a light denied to all the mathematicians in—some
would say through—a crack, and advertised in the *Times* that he
had done the trick. He then prepared this work, in which, those
who read it will see how, he showed that 3·14159.... should be
3·0625. He might have found out his error by *stepping* a
draughtsman's circle with the compasses.

Perspective has not had many paradoxes. The only other one I remember is that of a writer on perspective, whose name I forget, and whose four pages I do not possess. He circulated remarks on my notes on the subject, published in the *Athenæum*, in which he denies that the stereographic projection is a case of perspective, the reason being that the whole hemisphere makes too large a picture for the eye conveniently to grasp at once. That is to say, it is no perspective because there is too much perspective.

> Principles of geometry familiarly illustrated. By the Rev. W. Ritchie, LL.D. London, 1833, 12mo.
> A new exposition of the system of Euclid's Elements, being an attempt to establish his work on a different basis. By Alfred Day, LL.D. London, 1839, 12mo.

These works belong to a small class which have the peculiarity of insisting that in the general propositions of geometry a proposition gives its converse; that "Every B is A" follows from "Every A is B." Dr. Ritchie says, "If it be proved that the equality of two of the angles of a triangle depends *essentially* upon the equality of the opposite sides, it follows that the equality of the opposite sides depends *essentially* on the equality of the angles." Dr. Day puts it as follows :—

"That the converses of Euclid, so called, where no particular limitation is specified or implied in the leading proposition, more than in the converse, must be necessarily true; for as by the nature of the reasoning the leading proposition must be universally true, should the converse not be so, it cannot be so universally, but has at least all the exceptions conveyed in the leading proposition, and the case is therefore unadapted to geometric reasoning, or, what is the same thing, by the very nature of geometric reasoning, the particular exceptions to the extended converse must be identical with some one or other of the cases under the universal affirmative proposition with which we set forth, which is absurd."

On this I cannot help transferring to my reader the words of the Pacha when he orders the bastinado—" May it do you good !" A rational study of logic is much wanted to show many mathematicians, of all degrees of proficiency, that there is nothing in the *reasoning* of mathematics which differs from other reasoning. Dr. Day repeated his argument in *A Treatise on Proportion*, London, 1840, 8vo. Dr. Ritchie was a very clear-headed man. He published, in 1818, a work on arithmetic, with rational explanations. This was too early for such an improvement, and nearly the whole of this excellent work was sold as waste paper. His elementary introduction to the Differential Calculus was drawn up while he was learning the subject late in life. Books of this sort are often very effective on points of difficulty.

> Letter to the Royal Astronomical Society in refutation of mistaken
> notions held in common, by the Society, and by all the Newtonian
> philosophers. By Capt. Forman, R.N. Shepton-Mallet, 1833, 8vo.

Capt. Forman wrote against the whole system of gravitation,
and got no notice. He then wrote to Lord Brougham, Sir J.
Herschel, and others I suppose, desiring them to procure notice of
his books in the reviews: this not being acceded to, he wrote (in
print) to Lord John Russell to complain of their "dishonest" con-
duct. He then sent a manuscript letter to the Astronomical
Society, inviting controversy; he was answered by a recommenda-
tion to study dynamics. The above pamphlet was the consequence,
in which, calling the Council of the Society "craven dunghill
cocks," he set them right about their doctrines. From all I can
learn, the life of a worthy man and a creditable officer was com-
pletely embittered by his want of power to see that no person is
bound in reason to enter into controversy with every one who
chooses to invite him to the field. This mistake is not peculiar to
philosophers, whether of orthodoxy or paradoxy; a majority of
educated persons imply, by their modes of proceeding, that no one
has a right to any opinion which he is not prepared to defend
against all comers.

> David and Goliath, or an attempt to prove that the Newtonian system
> of astronomy is directly opposed to the Scriptures. By Wm. Lauder,
> Sen., Mere, Wilts. Mere, 1833, 12mo.

Newton is Goliath; Mr. Lauder is David. David took five
pebbles; Mr. Lauder takes five arguments. He expects opposi-
tion; for Paul and Jesus both met with it.

No. XV. 1834—1835.

> A Treatise on the Divine System of the Universe, by Captain Woodley,
> R.N., and as demonstrated by his universal time-piece, and universal
> method of determining a ship's longitude by the apparent true place
> of the moon; with an introduction refuting the solar system of Coper-
> nicus, the Newtonian philosophy, and mathematics. 1834, 8vo.
> Description of the universal time-piece. (4 pp. 12mo.)

I think this divine system was published several years before,
and was republished with an introduction in 1834. Capt. Woodley
was very sure that the earth does not move; he pointed out to me,
in a conversation I had with him, something—I forget what—in
the motion of the Great Bear, visible to any eye, which could not
possibly be if the earth moved. He was exceedingly ignorant, as

the following quotation from his account of the usual opinion will show :—

> " The north pole of the Earth's axis deserts, they say, the north star or pole of the Heavens, at the rate of 1° in 71¾ years. . . . The fact is, nothing can be more certain than that the Stars have not changed their latitudes or declinations *one degree* in the last 71¾ years."

This is a strong specimen of a class of men by whom all accessible persons who have made any name in science are hunted. It is a pity that they cannot be admitted into scientific Societies, and allowed fairly to state their cases, and stand quiet cross-examination, being kept in their answers very close to the questions, and the answers written down. I am perfectly satisfied that if one meeting in the year were devoted to the hearing of those who chose to come forward on such conditions, much good would be done. But I strongly suspect few would come forward at first, and none in a little while : and I have had some experience of the method I recommend, privately tried. Capt. Woodley was proposed, a little after 1834, as a Fellow of the Astronomical Society ; and, not caring whether he moved the sun, or the earth, or both—I could not have stood *neither*—I signed the proposal. There was so little feeling against his opinions, that he only failed by a fraction of a ball. Had I myself voted, he would have been elected ; but being engaged in conversation, and not having heard the slightest objection to him, I did not think it worth while to cross the room for the purpose. I regretted this at the time, but had I known how ignorant he was I should not have supported him. Probably those who voted against him knew more of his books than I then did.

I remember no other instance of exclusion from a scientific Society on the ground of opinion, even if this be one ; of which it may be that ignorance had more to do with it than paradoxy. Mr. Frend, a strong anti-Newtonian, was a Fellow of the Astronomical Society, and for some years in the Council. Lieutenant Kerigan was elected to the Royal Society at a time when his proposers must have known that his immediate object was to put F.R.S. on the title-page of a work against the tides. To give all I know, I may add that the editor of some very ignorant bombast about the "forehead of the solar sky," who did not know the difference between *Bailly* and *Baily*, received hints which induced him to withdraw his proposal for election into the Astronomical Society. But this was an act of kindness ; for if he had seen Mr. Baily in the chair, with his head on, he might have been political historian enough to faint away.

De la formation des Corps. Par Paul Laurent. Nancy, 1834, 8vo.

Atoms, and ether, and ovules or eggs, which are planets, and their eggs, which are satellites. These speculators can create worlds, in which they cannot be refuted : but none of them dare attack the problem of a grain of wheat, and its passage from a seed to a plant, bearing scores of seeds like what it was itself.

> An account of the Rev. John Flamstead, the First Astronomer-Royal...
> By Francis Baily, Esq. London, 1835, 4to. Supplement, London, 1837, 4to.

My friend Francis Baily was a paradoxer : he brought forward things counter to universal opinion. That Newton was impeccable in every point was the national creed ; and failings of temper and conduct would have been utterly disbelieved, if the paradox had not come supported by very unusual evidence. Anybody who impeached Newton on existing evidence might as well have been squaring the circle, for any attention he would have got. About this book I will tell a story. It was published by the Admiralty for distribution; and the distribution was intrusted to Mr. Baily. On the eve of its appearance, rumours of its extraordinary revelations got about, and persons of influence applied to the Admiralty for copies. The Lords were in a difficulty : but on looking at the list they saw names, as they thought, which were so obscure that they had a right to assume Mr. Baily had included persons who had no claim to such a compliment as presentation from the Admiralty. The Secretary requested Mr. Baily to call upon him. " Mr. Baily, my Lords are inclined to think that some of the persons in this list are perhaps not of that note which would justify their Lordships in presenting this work."—" To whom does your observation apply, Mr. Secretary ?"—" Well now, let us examine the list; let me see; now,—now,—now,—come !—here's Gauss— *who's Gauss ?*"—" Gauss, Mr. Secretary, is the oldest mathematician now living, and is generally thought to be the greatest." —" O-o-oh ! Well, Mr. Baily, we will see about it, and I will write you a letter." The letter expressed their Lordships' perfect satisfaction with the list.

> God's creation of the Universe as it is, in support of the Scriptures.
> By Mr. Finleyson. Sixth Edition, 1835, 8vo.

This writer, by his own account, succeeded in delivering the famous Lieut. Richard Brothers from the lunatic asylum, and tending him, not as a keeper but as a disciple, till he died. Brothers was, by his own account, the nephew of the Almighty, and Finleyson ought to have been the nephew of Brothers. For

Napoleon came to him in a vision, with a broken sword and an arrow in his side, beseeching help: Finleyson pulled out the arrow, but refused to give a new sword; whereby poor Napoleon, though he got off with life, lost the battle of Waterloo. This story was written to the Duke of Wellington, ending with " I pulled out the arrow, but left the broken sword. Your Grace can supply the rest, and what followed is amply recorded in history." The book contains a long account of applications to Government to do three things: to pay £2,000 for care taken of Brothers, to pay £10,000 for discovery of the longitude, and to prohibit the teaching of the Newtonian system, which makes God a liar. The successive administrations were threatened that they would have to turn out if they refused, which, it is remarked, came to pass in every case. I have heard of a joke of Lord Macaulay, that the House of Commons must be the Beast of the Revelations, since 658 members, with the officers necessary for the action of the House, makes 666. Macaulay read most things, and the greater part of the rest: so that he might be suspected of having appropriated as a joke one of Finleyson's serious points—" I wrote Earl Grey upon the 13th of July, 1831, informing him that his Reform Bill could not be carried, as it reduced the members below the present amount of 658, which, with the eight principal clerks or officers of the House, make the number 666." But a witness has informed me that Macaulay's joke was made in his hearing a great many years before the Reform Bill was proposed; in fact, when both were students at Cambridge. Earl Grey was, according to Finleyson, a descendant of Uriah the Hittite. For a specimen of Lieut. Brothers, this book would be worth picking up. Perhaps a specimen of the Lieutenant's poetry may be acceptable: Brothers *loquitur*, remember :—

> " Jerusalem! Jerusalem! shall be built again!
>   More rich, more grand than ever;
> And through it shall Jordan flow! (!)
>   My people's favourite river.
> There I'll erect a splendid throne,
>   And build on the wasted place;
> To fulfill my ancient covenant
>   To King David and his race.
>   *   *   *   *
> Euphrates' stream shall flow with ships,
>   And also my wedded Nile!
> And on my coast shall cities rise,
>   Each one distant but a mile.
>   *   *   *   *

My friends the Russians on the north,
    With Persees and Arabs round,
Do show the limits of my land,
    Here! Here! then I mark the ground."

(*To be continued.*)

CORRESPONDENCE.

SOLUTION OF PROBLEM PROPOSED BY JUVENIS.
To the Editor of the Assurance Magazine.

SIR,—Referring to the question proposed by Juvenis, in the April Number of the *Magazine*, I send the particulars of the method which I adopted to find an approximate solution.

The question is, if I understand it correctly, "What is the value of a perpetuity to be enjoyed by 48, in the event of 55, 53, 51, and 50, all dying before him; the first payment to be made at the end of the year in which the *last* of these four lives should fail?"

The value of this perpetuity, at 4 per cent, will be equal to an assurance of £26, payable if 55, 53, 51, and 50, should all die before 48. In order to simplify the solution, I substituted a single life, corresponding to the value of an annuity on the *longest* of the four lives, and found the value of an assurance payable if the single life, thus obtained, should die before 48. The value was, at 4 per cent. and using the Carlisle tables, 3·7752 years' purchase of the rental of the estate.

There are, however, many things which would have an important bearing on this value; for instance, the state of 48's health and of that of the other lives, whether they are related to each other by blood, &c.; in short, actuaries would, in stating a value, be guided more by their own judgment than by any tabular or mathematical value, which can only, without great trouble, be approximate. If 48 were selling his interest, it is quite probable that he would only realise two years' purchase for it.

I am, Sir,
    Yours obediently,
                        T. M.

THE SAME SUBJECT.
To the Editor of the Assurance Magazine.

SIR,—The suggestion made by Juvenis in the last April Number of our *Journal* is one which I, and I believe many others engaged in our pursuits, would be glad to see extensively acted upon.

The estimates of actuaries are now constantly made the subjects of discussion in courts of law and equity and before other tribunals; and the great difference of opinion which they so frequently exhibit becomes conspicuous, and tends to bring such estimates into doubt and general discredit. Any process, therefore, which will serve to bring this want of agreement